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who presented the deed to the trustees of the Peabody Museum of Cambridge. Professor Putnam's report, in connection with a brief letter from Miss Alice Fletcher, led to an important discussion on the preservation of mounds and relics, and the opinion was expressed unanimously that some step must be taken in this direction. In order to impress the United States and the State governments and legislatures with the importance of this matter, it was moved that the association, in a general session, appoint a committee whose task it should be to take the necessary steps in this direction. Mrs. Stevenson, president of the Ladies' Anthropological Society of Washington, and Miss Fletcher, were elected members of the committee. Major Powell's remarks on the difficulties which would be encountered in carrying out the proposed scheme, and the fact that attempted 'preservations' had sometimes ended in actual destruction, led to the election of a second committee of five members, for impressing the State historical societies and legislatures with the importance of the matter, and inducing them to preserve the relics in their territories, while the former committee will draw the attention of Congress to those situated on public lands.

The desire to draw greater attention to archæology was also characteristic of Prof. Thomas Wilson's paper on the state of archæology in western Europe. He showed that in America, though the interest of the public is increasing, nothing equal to the work of European nations has been done. Scandinavian archæologists ought to be our teachers in this line of research: they were the first to work out scientific methods and to undertake researches on a great scale. Professor Wilson laid great stress on the influence of European societies and scientific institutions and of the support of the government upon the rapid development of prehistoric anthropology.

The papers and discussions on archæological subjects showed that a closer connection between geologists and archæologists is very desirable, or, rather, that the student of archæology ought to be conversant with dynamical geology, more particularly with the influence of water and wind upon the earth's surface. This is the only method to avoid serious errors and to reach satisfactory results. Prof. C. C. Abbott's method, which he explained during the sessions in numerous remarks and in his paper on evidences of pre-Indian occupation of New Jersey, makes it clear that this is the most satisfactory method of study. Of course, the form of the implements must also be considered. Dr. Brinton's suggestion, that the occurrence of simple implements and of compound implements (i.e., those in which the worked stones are attached to handles) should be made a principle of division of the paleolithic age, may be accepted in so far as we must suppose, *a priori*, that simple implements were the earliest inventions of developing mankind. It is, however, doubtful whether the finds really justify a separate consideration of both ages. The important question of the age of American antiquities, and whether they belonged to the Indians inhabiting the continent at the time of the discovery or to a pre-Indian race, received its proper share of attention. Besides Professor Abbott's paper, which was mentioned above, Mr. G. N. Perkins's remark, that in the Champlain valley a steady development of forms, from the most ancient to the recent ones, may be observed, deserves to be mentioned.

The desire of tracing the earliest history of man in America, which is the most vigorous inducement of American archæology, was also the basis of Horatio Hale's paper on the true basis of ethnology. A few weeks ago Major Powell had expressed, in a letter to *Science*, the opinion that there can be no ethnology, as all attempts to classify mankind have failed. This refers to ethnology, as defined by Powell, as the science treating of the classification of mankind. Professor Hale opposes this opinion, maintaining that the languages afford a sufficient basis for the classification of man into races. Major Powell, in defence of the position he had taken, said that languages, customs, and religions were only adhering to the individual, while the anthropological character was the only constant phenomenon. But here, as well as in the ethnological characteristics of races, admixtures of blood had made it impossible to reach satisfactory results. This elicited the important remark from Dr. Brinton, with which we heartily concur, that language and religion of the individual may be easily changed, but that tribes and races do not so readily adopt new social institutions and

new languages, and that not the individual, but the tribe, is the important object of study. His opinion is, that the psychology of nations is the true basis of ethnology, and we may add that the history of civilization is its ultimate aim.

Methods of ethnological researches are making steady progress. This is shown by the papers of Dr. Wesley Mills, on the study of a small and isolated community in the Bahama Islands; and by that of Mr. Steward Culin, 'China in America.' The former is a contribution to the solution of the problem of the influence of monotony in climate and social institutions upon man: the latter treats of another interesting question which is of the greatest importance in studying the history of mankind,—the constancy of ethnological peculiarities, and the influence of one people upon another. Papers treating of the ethnology of certain tribes were comparatively few. Great interest was excited by two specimens shown by Mr. G. F. Kunz, — a gigantic jadeite adze from Oaxaca, Mexico, which shows signs of being cut from a boulder by the use of a string, and is beautifully carved and polished; and a very remarkable human skull of rock crystal in natural size, probably of Mexican origin. On this occasion we had the pleasure of hearing the assumed similarity between the Mexican and Japanese arts thoroughly refuted by Mr. Tatui Baba. In fact, the task of proving the similarity rests on the shoulders of those maintaining its existence.

The last paper we have to mention is that by Mr. J. Jastrow, on sensory types of memory and apperception. He discussed apperception as brought about by visual and audital perceptions, and treated of the connection of both kinds of perceptions in many individuals. He referred to the important bearing of this question on education, as different methods must be applied for the two classes of individuals. He gave some methods for determining the prevailing faculty. His opinion is, that the visualists form the more numerous class, but we believe that the universal existence of language shows the importance of auditalism. Researches in experimental psychology, such as Mr. Jastrow undertakes, are not yet carried on to a great extent in America, but we may hope that in course of time they will become an important feature of the sessions of the Anthropological Section, as this branch of science is one of the foundations of the psychology of individuals and of nations.

Section I.

[Report not received in time for this issue.]

THE GEOGRAPHICAL MOVEMENT IN ENGLAND.

I WAS asked some time ago to furnish *Science* with an account of the results of the efforts of the Royal Geographical Society towards the improvement of geographical education in England, and to give some idea of the character of the collection of appliances exhibited in London and elsewhere in connection with this movement. I have waited till now in order that I might be able to state positively that so far the society's efforts have met with almost complete success. The University of Oxford has just appointed a reader in geography; not only so, but the appointment has been given, I believe I am safe in saying, to the only one among the numerous candidates likely to carry out the views of the Geographical Society as to what the geography of the future should be. Mr. Harford J. Mackinder, the new reader in geography, is a young graduate of Oxford, who has taken high honors both in science and in history, and thus is qualified to treat geography adequately on all its sides. As one of the lecturers in connection with the Oxford University extension scheme, he has attended large and enthusiastic audiences in various English provincial towns. What his conception of geography is may be seen from the paper which he read before the Geographical Society, and which is printed in the Proceedings of March, 1887. Cambridge University has decided to follow the example of Oxford in the beginning of next year, and meantime has requested the council of the Geographical Society to nominate one or more of its members to lecture on the subject in the autumn of the present year.

Thus it will be seen, that, so far as our two great universities are concerned, the recent efforts of the society have been completely successful: for it must be borne in mind that the council of the society have all along felt, that, unless geography were recognized

at our universities, it would be hopeless to attempt to make any impression, on our higher schools at least. Now, with two good men, working on right lines, and filled with contagious enthusiasm, at our two great universities, we may confidently expect that improvement will filter downwards.

It is nearly twenty years since the society felt compelled to raise geography from the low level it has occupied in English education. It memorialized both Oxford and Cambridge, but its memorials were scarcely even honored by a reply. Medals were offered for competition among certain (about fifty) selected schools of the higher grade; but after sixteen years these were dropped, from lack of competitors. Three years ago the council resolved to institute a thorough inquiry into the whole question of the position of geography at home and abroad, and did me the honor of appointing me to conduct the inquiry. The results of the inquiry have been published in the form of a report, which has been referred to at some length, on various occasions, in *Science*, so that I need not analyze it in detail here. The general conclusion was, that except in a few rare cases, depending mainly on the tastes of individual teachers, geography has no substantial place in English education. In many of our higher schools it is not taught at all. In most cases where it is taught, it is the barrenest of studies, consisting in the learning of long lists of names and figures. Rarely was any attempt made to show the intimate connection between physical and political geography, the latter being taken almost invariably in its narrowest and meagrest acceptation. In our elementary schools, on the other hand, some attempt is made, under the guidance of the Government Code, to make the subject a reality; but even here it is by no means compulsory. On the continent, again, especially in Germany, geography is everywhere taught, in every grade of school, and throughout nearly all classes in all schools. While the position is not the same throughout all the provinces of Germany, and while here also a good deal depends upon the teacher, still the subject holds a high position, and is taught after intelligent methods. It was everywhere admitted that improvement in Germany has been largely due to the establishment of chairs in the universities, of which there are now a dozen. In Austria, France, Italy, Holland, Belgium, Norway, Sweden, the position of the subject and the methods of teaching were far ahead of what we find in England. The Education Bureau of the United States very kindly instituted, on behalf of the society, an inquiry into the position of the subject in the schools there. Unfortunately the voluminous documents thus collected did not reach me until after my report was written; but, from what I gather from the documents, I fear American schools, so far at least as the methods and standard of the subject are concerned, are not very far ahead of those of the Old Country.

There can be little doubt that the society's recent action, apart from the results in the universities, has had considerable effect on the schools generally. It has drawn wide attention to the subject; not only laid bare its neglect and the poverty and wretched quality of the appliances used in teaching, but has set before the public a higher standard than was dreamt of before, and indicated how the despised and rejected subject might, with proper methods, become one of the most fruitful fields of scientific-historical research. It has been shown that geography has a field uncovered by any other department. Of what is known as physical geography, — the topographical surroundings of humanity, — there is not much to complain: its facts and principles are pretty well known, and fairly set forth in numerous text-books. It is when we come to apply these facts to humanity, to deal with their bearings on the development of man in communities, that we find so much to desire. Mr. Mackinder defines geography as the physical basis of history: may we not extend this, and say it is the physical basis of all the activities of collective humanity? At present 'political' geography consists mainly of a catalogue of States and their subdivisions, their routes, towns, and 'chief manufactures.' If 'political' were taken in its wider and more correct sense, and political geography treated as the department of knowledge that dealt with the development of States so far as that is influenced by geographical conditions, then it is evident that both as a branch of knowledge and as a discipline we might expect the most fruitful results. What are the lines on which this new geography should run may be learned from the lecture of Mr. Mackinder, referred to above; from the lecture de-

livered in connection with the society's exhibition, and presented in one large volume along with my report; and from an admirable paper by Dr. Boas in *Science* a few months ago. To attempt to develop the subject further here would take more space than can be allowed me. Suffice it to say that this aspect of it is rapidly gaining ground in England, both in our schools and among thoughtful men generally, and I am confident will make more rapid headway in the future.

It was part of my duty to collect specimens of the various appliances used in teaching geography at home and abroad. The collection thus formed so grew on our hands that it developed into a somewhat formidable space when displayed. This collection was on view in a large hall in London in the end of 1885 and beginning of 1886. During 1886 it was sent by request to Manchester, Edinburgh, and Bradford, and at each place attracted large numbers of visitors, chiefly teachers and those interested in education. The collection was not meant to be a model one, but only typical of the various appliances in use. It therefore contained good and bad; more of the latter, I fear, than of the former. The most prominent feature was the collection of wall-maps from the leading European countries. Besides these, there were relief-maps of all sizes, models, globes, telluria, text-books, atlases, and hand-maps, and a variety of other odds and ends. The principal result of this exhibition was to bring out in strong relief the poverty of English productions of this class, especially when compared with the variety and excellence of the appliances used in Germany. English wall-maps, for example, like English text-books and English geographical teaching generally, seem mainly intended to record names. Physical features are entirely subordinate, and special physical maps are rarely met with in our schools. High and aimless coloring is the most prominent feature of our maps and atlases; and these, with our text-books, reflect painfully the low standard of the subject which exists here. German maps, again, while capable enough of improvement, are in execution, instructiveness, intelligence, and accuracy, far above any thing we have here, except in one or two cases. In the best German schools we find wall-maps always in pairs; a physical map, with physical features simply, but permanently laid down, and no names; and a political map, with the physical features subordinate but clear, in which the political features and names are laid down. Some of the best wall-maps come from Winterthur, near Zürich, from the establishment of Randegger, and are almost perfect specimens of cartography. Even Italy, following close on the heels of Germany, furnishes its schools with better maps than does England; while France, though improving, is not often very far ahead of ourselves. To Italy we owe some of the best large relief-maps, — maps accurately executed from surveys, and with the minimum exaggeration of altitudes. At the same time Delagrave of Paris sent some beautiful specimens of large relief-maps by Mlle. Kleinhaus. The great model of the Monte Rosa group, executed by Imfeld and Heim of Zürich, was the gem of our exhibition, and has been secured for the science collection at South Kensington. Unfortunately its price places it beyond the reach of most schools. But reliefs of a glacier, of a volcanic island, and other subjects, by Professor Heim, are cheap enough, and of the greatest utility in teaching physical geography. I am glad to say that not a few teachers were induced to invest in copies. The globes were mostly too small. No globe under eighteen inches diameter is of much use for the purpose for which such an article is ordinarily used. The larger the better, but unfortunately large globes are too dear for ordinary schools. We had one or two relief-globes, but the exaggeration of altitudes is so great as to render such globes pernicious. We had some very large black slate globes of foreign make and wonderfully cheap, with only the lines of latitude and longitude marked. These globes, in the hands of good teachers, can be put to excellent use in a variety of ways. The ordinary planetaria and telluria are mere toys. Their mechanism is so coarse and elaborate as to convey the most erroneous conceptions to young pupils. The most useful thing of this kind was a simple terrestrial globe on a revolving arm, with a small glass globe in the centre to hold a candle, which represents the sun. But any teacher who knows his business, can, with a simple ball or an orange, and a lamp, show all that the most elaborate tellurium can illustrate, and with much less risk

of conveying misleading ideas. We had a simple and highly instructive arrangement devised by Mr. Francis Galton, to whose initiation I may say the whole of this geographical movement is due, to show the relative sizes of sun and earth and moon. We supposed the distance between sun and earth to be reduced to 56 feet. On a wall we fixed a disk of cardboard colored yellow, 6 inches in diameter, for the sun. On a table 56 feet away we had a pellet of wax, .056 of an inch in diameter, suspended by a hair to the end of a splinter of wood 1.68 inches in diameter, to represent the earth. At the other end was another pellet, .015 of an inch in diameter, to represent the moon. This arrangement costs nothing, and can be adapted to any building. In fact, there is ample room for a variety of demonstration of the kind in connection with geographical teaching, as well as of experiments to illustrate geographical facts. Thus the crumpling of the earth's crust might be illustrated by bringing lateral pressure to bear on a plastic material; and already in a few English schools sand and clay are used to build up the physical features of a country or region. The magic lantern also may be used with great effect to produce large-scale maps on the screen, to exhibit special features, and to bring pictures of typical landscapes before the eyes of the pupils. One of the most interesting and novel of our exhibits consisted of several series of geographical pictures from Germany; that is, pictures whose special object is to show the characteristic features of the various regions of the globe, and the typical forms assumed by the leading classes of phenomena with which geography deals. The best of these pictures is the series of about thirty oleographs published by Holzel of Vienna, and which are now coming into use in this country. Above all things, such pictures must be accurate, and therefore good large-scale photographs are often to be preferred, — such photographs, for example, as are produced by the United States surveys and by private enterprise, — of some of the most striking features in American scenery. For teaching purposes, however, it should be remembered that it is not extraordinary features that are desired, but typical aspects of the earth's surface, — ordinary mountain forms, a prairie, a delta, a tundra, a steppe region, a coral island, a sandy desert, and so on.

The text-books and atlases which were exhibited were analogous to the wall-maps. The English text-books were mostly too large, and too crowded with names and tables, and made no attempt whatever to show the intimate relation between all sections of geography, and the influence which man's geographical surroundings has upon his social and political development. The German text-books are comparatively small; contain mostly heads of subjects, the filling-up being left to the teacher, who has generally had a thorough training in geography at the university or the normal school. I am sorry I cannot speak very highly of American text-books. As a rule, the American text-book is combined with an atlas and picture-book, — an arrangement which I do not consider a happy one. Neither text, nor maps, nor pictures, are any better shown than we have on this side; and even with Guyot's geographical manuals we were much disappointed.

Altogether the collection of geographical appliances has proved most suggestive and instructive. Reform has already begun. Many schools are now using Kiepert's wall-maps, and publishers are making haste here to supply the glaring want of good text-books, atlases, and wall-maps. Teachers have been stirred up to recognize existing deficiencies, as well as the undreamt of capabilities of geography when treated liberally and intelligently. They see that in geography, as in mathematics, a special training is required if it is to be taught effectually. The society appeals to the elementary teacher by offering a series of prizes on the basis of the examinations of the training-college students, and many of the school boards are instituting radical improvements in their geographical appliances. Out of the collection, which is once more in London, we are forming a small typical collection for exhibition to any who may wish to know what are the best things in any department. This collection is of course very small to begin with; but we hope, that, as improvements are introduced, we may be able to extend it.

Altogether I hope it may be seen from these notes that the Geographical Society has at last succeeded in raising geography from the slough in which it has lain so long in this country; has not

only initiated great improvements in the teaching of the subject, and obtained its recognition at our great universities, but has shown that it is eminently capable of becoming a fruitful and instructive medium of research, worthy of taking its place alongside of other departments of scientific investigation. J. SCOTT KELTIE.

THE STUDY OF GEOGRAPHY.

THE *Ausland* of May 9 contains an extract of A. Stauber's essay on the promotion of the study of geography, which carried the prize offered by the King of Belgium. The author discusses the methods which ought to be applied in primary teaching, in high-schools, and in colleges. In the primary grade, the method is that of object-teaching. First, the geography of the child's own country is taught, beginning with the nearest surroundings, the school-house or home, the village or city, the county, and so on. The close connection between natural history and geography must be kept in mind by the teacher, who is warned against overburdening the children's brains with names and dates. The drawing of maps and the use of charts are recommended; but Stauber remarks justly that not too much weight should be laid on the drawing of maps, which must only be practised as a means to impress the configuration of the earth's surface more effectively on the child's mind. In the upper classes, an atlas ought to be used, but it is important to select maps which contain the proper amount of material and show the geographical features of the country clearly and simply. After the native country has been thoroughly studied, the geography of the native continent, and later on that of the other continents, is taught.

In high-schools and colleges the analytic method gradually takes the place of the synthetic. The reading of travels is recommended as a means of making the study more attractive and of preventing its becoming a mere memorizing. The connection between natural history and geography must always be emphasized, and characteristic objects ought always to be shown. But, in order to be able to do this kind of work, teachers ought to be thoroughly conversant with the problems of geography. This can only be accomplished by the study of geography at a university. Therefore the establishment of professorships of geography is demanded. At the present time there are seventy-five such professorships at European universities. In Prussia, every university has its professor of geography; at other German universities there are lecturers. In England, geography will be taught in Oxford and Cambridge, as lecturers were appointed a short time ago. In Belgium, Greece, Portugal, Sweden, and in the United States, the science of geography is not taught by specialists, but, when it is taught at all, only incidentally.

Among the manuscripts which received honorable mention is an American one by Prof. Richard Owen of New Harmony, Ind. We are indebted to the author for a statement of his proposals.

The first principles of his method of teaching are, that he only makes one step at a time from the known to the unknown, and that the eye instructs more than the ear, and that consequently, whenever practicable, the object that is being described, or a good representation of it, should be shown. As a consequence of his first principle, he presents only one thing at a time. For instance, he uses a separate outline map, 1st, for the general outlines of the continents; 2d, for the same with mountains only; 3d, for the same with rivers added; 4th, for all these with political divisions. He depends chiefly upon numerous plastic relief-maps as a system of instruction, and shows that these can be made very economically, and that children of from ten to twelve years of age take great interest in their construction. He begins his course in the same way as Stauber, by having the student study the geography of his home, and by having him make the plan and model of the school-house, or of his own house and garden, by measurement and according to a definite scale. Then he proceeds to teaching the topography of his town, county, state, and finally of the United States.

Using the globe, he begins to give his pupils an idea of the earth being nearly a sphere, by various demonstrations, and by calling in a traveller who testifies that he returned to the place of beginning of his travels by steadily travelling west, and thus teaches the elements of mathematical geography. In teaching, he uses numerous maps and diagrams, showing the phenomena of physical geography, and models to explain the forms of the earth's surface.